NEW ENGLAND SALT MARSH VAUCHERIAE

E. E. WEBBER[1]

Prior to 1953, only four species of *Vaucheria* (*V. compacta* (Collins) Collins, *V. litorea* C. Ag., *V. piloboloides* Thur., and *V. thuretii* Woron.) were known from marine and estuarine habitats of northeastern United States (Blum and Conover, 1953). At this time, collections of *Vaucheria* by these authors from salt marshes of the Woods Hole area yielded four additional species. Three of these had not been reported as occurring in North America. They are *V. arcassonensis* Dangeard, *V. coronata* Nord., and *V. intermedia* Nord. The fourth was described as a new species, *V. minuta*. Subsequent collections by Blum (1960) at Essex, Massachusetts resulted in the description of a second new species of *Vaucheria* from New England salt marshes, *V. vipera*.

From the extensive tidal marshes in the immediate vicinity of the Castle Neck River, Ipswich, Massachusetts, several *Vaucheria* species were encountered by the present author, the plant masses appearing as greenish-black "turfs" on mud and sandy-peat substrates. Descriptions and ecological observations of these plants are presented below.

V. intermedia Nord. fig. 1

Plants monoecious, vegetative filaments 15-31μ wide, oogonium spherical to somewhat elongate, 80-110μ diameter and 85-120μ long, opening by a terminal pore, oospores (74μ) 93-110μ diameter and not quite filling the oogonium; antheridia cylindrical, 26-36μ wide by 75-124μ long, opening by 1-3 lateral pores and subtended by what appears to be an empty cell, the antheridium either attached to the oogonium or on a separate branch at the base of the oogonium; vegetatively abundant in June and July, reproductive from September through the winter to early March.

Plants of this species were located in the mud at the seaward edges of the salt marsh, and in the sandy-peat soil

[1]The author thanks Dr. John L. Blum for his preliminary reading of this manuscript.

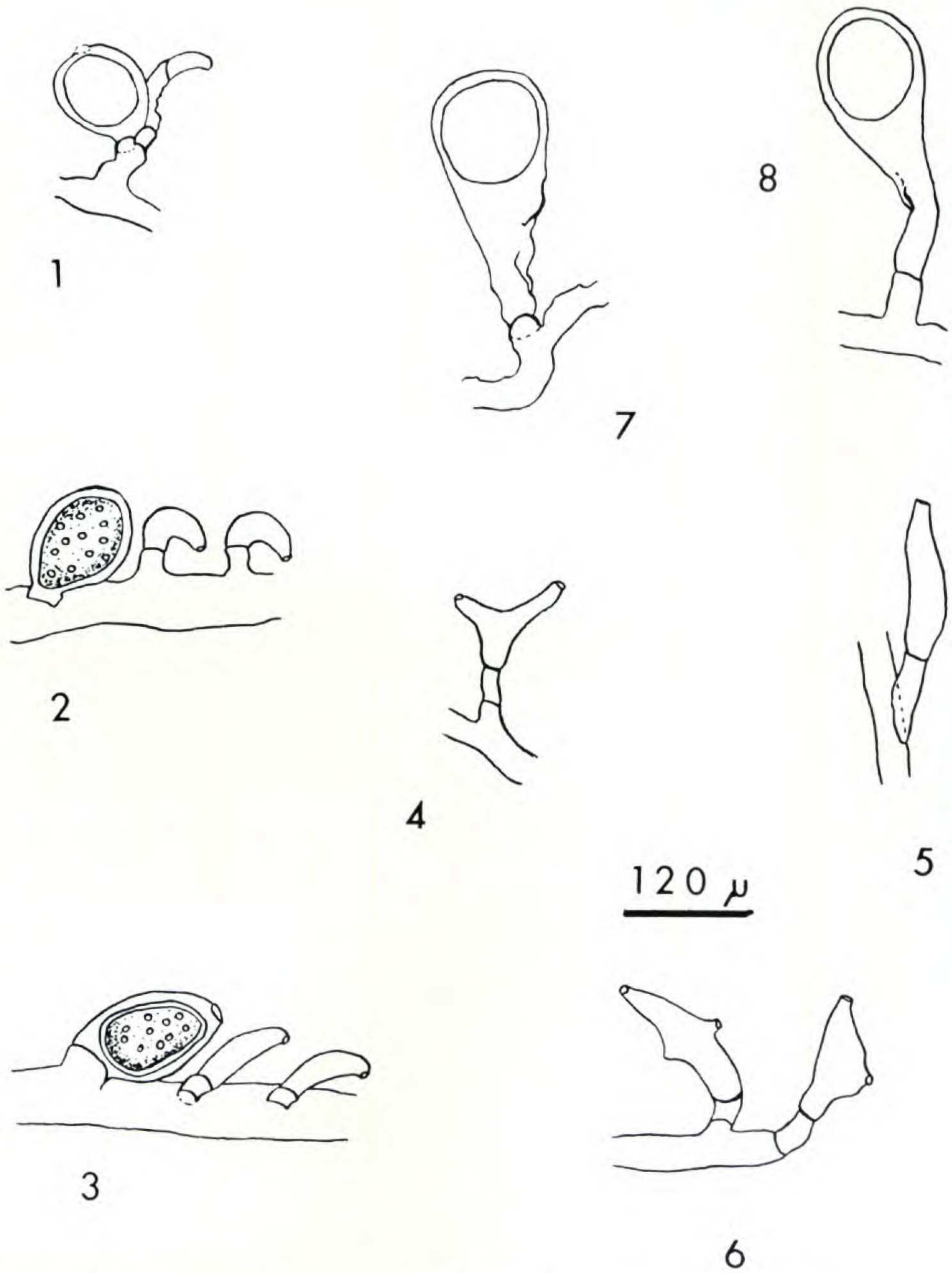

Fig. 1, *V. intermedia*, growth habit of antheridium and oogonium; Figs. 2, 3, *V. arcassonensis*, showing incurved character of both gametangia; Figs. 4-8, *V. compacta* var. *koksoakensis*, variation in antheridial morphology (4-6), and the typically long and terminally enlarged oogonia (7, 8).

at the bases of *Spartina patens* on the surface of the marsh, here admixed with *V. arcassonensis*.

Dangeard (1939) claimed *V. intermedia* as a brackish

water species, while Blum and Conover (1953) noted its ability to withstand a range in salinities from fresh water to sea water of 27°/oo. The latter authors further determined reproduction to occur between a temperature range of 0-18.5°C. The reproductive period of *V. intermedia* from Ipswich coincided with salinities of 17.5-33°/oo along with temperatures varying from -2° to 18°C.

V. arcassonensis Dangeard figs. 2, 3

Plants monoecious, filaments 55-62μ wide, oogonium sessile or short stalked, opening by a terminal pore, oospore ovoid-cylindrical, 80-91μ × 112-124μ, thick walled, and with many oil droplets, oospore essentially filling the oogonium, antheridia cylindrical, 31μ × 124μ, discharging terminally, both gametangia often incurved toward the filament; vegetatively abundant from June through August, reproductive during May.

This species formed conspicuous, mat-like expanses in the soil at the bases of *Spartina patens*.

The collections of *V. arcassonensis* by Blum and Conover (1953) are apparently the only record of this species in North America. While actual measurements of their plants are not given, they stated that "they do not seem to differ significantly in any way from the collection reported by Dangeard." In his original description, Dangeard (1939) cited filament widths of 36-54μ and oospores 60-70μ wide and 80-100μ long. Although the Ipswich plants are considerably larger than those reported by Blum and Conover (1953), they do not exceed the range of variability for this species (Blum, pers. comm.).

V. compacta (Collins) Collins figs. 4-8
var. *koksoakensis* Blum and Wilce

Plants dioecious, filaments 31-43μ wide, oogonium 236-550μ long and terminally enlarged, oospores spherical, 105-161μ diameter, antheridia stalked, 31-37μ × 86-170μ (192μ), subtended by an empty cell and discharging through lateral and terminal papillae (occasionally the papillae may be

lacking), several antheridia often produced per branch, or rarely the antheridium may bifurcate; vegetative in May and June, reproductive from July through November, carpeting the mud of creek banks.

Vaucheria compacta has been reported from Massachusetts salt marshes by Collins (1900) as *V. piloboloides* var. *compacta*. Recently, Blum and Conover (1953) found *V. compacta* in the Woods Hole area. In 1958 Blum and Wilce described a new variety of *V. compacta*, the variety *koksoakensis*, from Ungava Bay, Quebec, where the plants formed "turf-like" expanses on the intertidal mud near the mouth of the Koksoak River. They distinguished this new variety by the much greater length of the oogonium, as compared with that of *V. compacta*. Blum and Conover (1953) found *V. compacta* to be reproductive only during the winter at temperatures below 18.5°C. and salinities less than 27°/oo; however, the Ipswich plants of *V. compacta* var. *koksoakensis* reproduced from July through November, and occurred in environments with temperatures commonly to 25°C. and salinities to 27°/oo.

Thus, it appears that *V. compacta* var. *koksoakensis* is a variety having both morphological features and environmental relationships which distinguish it from *V. compacta*. Further, the collections from the Ipswich salt marsh represent the first record for the presence of *Vaucheria compacta* var. *koksoakensis* in the United States.

DEPARTMENT OF BIOLOGY
KEUKA COLLEGE, KEUKA PARK, N.Y. 14478

LITERATURE CITED

BLUM, J. L. 1960. A new *Vaucheria* from New England. Trans. Amer. Microscop. Soc. **79**(3):298-301.

————, and J. T. Conover. 1953. New or noteworthy Vaucheriae from New England salt marshes. Biol. Bull. **105**(3):395-401.

————, and R. T. Wilce. 1958. Description, distribution and ecology of three species of *Vaucheria* previously unknown from North America. Rhodora. **60**(718):283-288.

COLLINS, F. S. 1900. Notes on algae. II. Ibid. **2**:11-14.

DANGEARD, P. 1939. Le genre *Vaucheria*, spécialement dans la région du sud-ouest de la France. Le Botaniste. **29**:183-254.